

SOUTH CAROLINA INTERCONNECTION REQUEST APPLICATION FORM

Utility: Duke Energy Carolinas

Designated Utility Contact: Customer Owned Generation - Mail Code 14Q

E-Mail Address: Customerownedgeneration@duke-energy.com

Mailing Address: P.O. Box 1010

City: Charlotte State: NC Zip: 28201

Telephone Number: 866.233.2290

Fax: 980.373.5244

An Interconnection Request Application Form is considered complete when it provides all applicable and correct information required below.

Preamble and Instructions

An Interconnection Customer who requests a Public Service Commission of South Carolina jurisdictional interconnection must submit this Interconnection Request Application Form by hand delivery, mail, e-mail, or fax to the Utility. Your Utility may also allow you to complete your Interconnection Request Application Form by electronic enrollment on its website.

Request for: Fast Track Process ☐ Study Process ☒

(All Generating Facilities larger than 2 MW must use the Study Process.)

Processing Fee or Deposit

Fast Track Process – Non-Refundable Processing Fees

- If the Generating Facility is 20 kW or smaller, the fee is \$100.
- If the Generating Facility is larger than 20 kW but not larger than 100 kW, the fee is \$250.
- If the Generating Facility is larger than 100 kW but not larger than 2 MW, the fee is \$500.

Study Process – Deposit

If the Interconnection Request is submitted under the Study Process, whether a new submission or an Interconnection Request that did not pass the Fast Track Process, the Interconnection Customer shall submit to the Utility an Interconnection Facilities Deposit Charge of \$10,000 plus \$1 per kW_{AC} inclusive of a \$1000 fee to administer the Interconnection Request study process.

Change in Ownership – Non-Refundable Processing Fee

If the Interconnection Request is submitted solely due to a transfer of ownership or change of control of the Generating Facility, the fee is \$50.

Interconnection Customer Information

Legal Name of the Interconnection Customer (or, if an individual, individual's name)

Name: Duke Energy Carolinas LLC
 Contact Name: Adam Nygaard
 Title: Business Development Manager
 E-Mail Address: Adam.Nygaard@duke-energy.com
 Mailing Address: 400 South Tryon Street
 City: Charlotte State: NC Zip: 28202
 County: Mecklenburg
 Telephone (Day): (704) 382-6208 (Evening): _____
 Fax: _____

Facility Location (if different from above):

Address: 3027 Martin Luther King Jr Blvd
 City: Anderson State: SC Zip: 29625
 County: Anderson

Alternative Contact Information/Owner/Lessor (if different from the Interconnection Customer)

Contact Name: Sherif Abdelrazek
 Title: Senior Engineer
 Office of Regulatory Staff Certificate Number (if applicable): _____
 E-Mail Address: Sherif.Abdelrazek@duke-energy.com
 Mailing Address: 400 South Tryon St., ST 14Q
 City: Charlotte State: NC Zip: 28202
 Telephone (Day): 980.373.6992 (Evening): _____
 Fax: _____

Application is for: X New Generating Facility
 _____ Capacity Change to a Proposed or Existing Generating Facility

_____ Change of Ownership of a Proposed or Existing
Generating Facility to a new legal entity

_____ Change of Control of a Proposed or Existing
Generating Facility of the existing legal entity.

If capacity addition to existing Generating Facility, please describe: _____

Will the Generating Facility be used for any of the following?

Net Metering? Yes _____ No _____

To Supply Power to the Interconnection Customer? Yes _____ No _____

To Supply Power to the Utility? Yes X No _____

To Supply Power to Others? Yes _____ No _____

(If yes, discuss with the Utility whether the interconnection
is covered by the SC Interconnection Standard.)

Requested Point of Interconnection: See site plan

Requested In-Service Date: 06 / 01 / 2020

For installations at locations with existing electric service to which the
proposed Generating Facility will interconnect, provide:

Local Electric Service Provider*: Duke Energy Carolinas

Existing Account Number : N/A

[*To be provided by the Interconnection Customer if the local electric service provider is
different from the Utility]

Contact Name: _____

Title: _____

E-Mail Address: _____

Mailing Address: _____

City: _____ State: _____ Zip: _____

Telephone (Day): _____ (Evening): _____

Fax: _____

Generating Facility Information

Data apply only to the Generating Facility, not the Interconnection Facilities.

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Prime Mover: Photovoltaic (PV) ____ Fuel Cell ____ Reciprocating Engine ____
 Gas Turbine ____ Steam Turbine ____ Micro-turbine ____
 Other _____

Energy Source:

Renewable

- ☐ Solar – Photovoltaic
- ☐ Solar – thermal
- ☐ Biomass – landfill gas
- ☐ Biomass – manure digester gas
- ☐ Biomass – directed biogas
- ☐ Biomass – solid waste
- ☐ Biomass – sewage digester gas
- ☐ Biomass – wood
- ☐ Biomass – other (specify below)
- ☐ Hydro power – run of river
- ☐ Hydro power - storage
- ☐ Hydro power – tidal
- ☐ Hydro power – wave
- ☐ Wind
- ☐ Geothermal
- ☒ Other (specify below)

Non-Renewable

- ☐ Fossil Fuel - Diesel
- ☐ Fossil Fuel - Natural Gas (not waste)
- ☐ Fossil Fuel - Oil
- ☐ Fossil Fuel – Coal
- ☐ Fossil Fuel – Other (specify below)
- ☐ Other (specify below)

Energy Storage

Type of Generator: Synchronous ____ Induction ____ Inverter X

Total Generator Nameplate Rating: kW_{AC} 5,000 Kw_{DC} 5,000 kVAR _____

Interconnection Customer or Customer-Site Load: 0 kWAC (if none, so state)

Interconnection Customer Generator Auxiliary Load: 0 kWAC

Typical Reactive Load (if known): 0 kVAR

Maximum Physical Export Capability Requested: 5,000 kW_{AC}
 (The maximum continuous electrical output of the Generating Facility at any time
 at a power factor of approximately unity as measured at the Point of
 Interconnection and the maximum kW delivered to the Utility during any

metering period.)

List components of the Generating Facility equipment package that are currently certified:

Number	Equipment Type	Certifying Entity
1. <u>2</u>	<u>SMA 2500-EV-US Inverter</u>	<u>UL 1741</u>
2. _____	_____	_____
3. _____	_____	_____
4. _____	_____	_____
5. _____	_____	_____

Generator (or solar panel information)

Manufacturer, Model Name, & Quantity: N/A

Nameplate Output Power Rating in kW_{AC}: N/A Summer N/A Winter

Nameplate Output Power Rating in kVA: N/A Summer N/A Winter

Individual Generator Rated Power Factor: Leading _____ Lagging _____

Total Number of Generators in wind farm to be interconnected pursuant to this Interconnection Request (if applicable): _____ Elevation: _____

Inverter Manufacturer, Model Name, & Quantity (if used): _____

Note: The utility may request a completed Power Systems Load Flow data sheet be supplied as a supplement the Interconnection Request.

For solar projects provide the following information:

Latitude: _____ Degrees _____ Minutes North

Longitude: _____ Degrees _____ Minutes West

Orientation: _____ Degrees (Due South=180°)

Fixed Tilt Array ☐ Single Axis Tracking Array ☐ Double Axis Tracking Array ☐

Fixed Tilt Angle: _____ Degrees

Impedance Diagram - If interconnecting to the Utility System at a voltage of 44-

kV or greater, provide an Impedance Diagram. An Impedance Diagram may be required by the Utility for proposed interconnections at lower interconnection voltages. The Impedance Diagram shall provide, or be accompanied by a list that shall provide, the collector system impedance of the generation plant. The collector system impedance data shall include equivalent impedances for all components, starting with the inverter transformer(s) up to the utility level Generator Step-Up transformer.

Load Flow Data Sheet - If interconnecting to the Utility System at a voltage of 44-kV or greater, provide a completed Power Systems Load Flow data sheet. A Load Flow data sheet may be required by the Utility for proposed interconnections at lower interconnection voltages.

Excitation and Governor System Data for Synchronous Generators - If interconnecting to the Utility System at a voltage of 44-kV or greater, provide appropriate IEEE model block diagram of excitation system, governor system and power system stabilizer (PSS) in accordance with the regional reliability council criteria. A PSS may be required at lower interconnection voltages. A copy of the manufacturer's block diagram may not be substituted.

Generating Facility Characteristic Data (for inverter-based machines)Max design fault contribution current: 185A@12.47kV RMSHarmonics Characteristics: <3% @ Full Power

Start-up requirements: _____

Inverter Short-Circuit Model Data

Model and parameter data required for short-circuit analysis is specific to each PV inverter make and model. All data to be provided in per-unit ohms, on the equivalent inverter MVA base.

Values below are valid for initial 2 to 6 cycles:

Inverter Equivalent MVA Base: _____ MVA

Short-Circuit Equivalent Pos. Seq. Resistance (R1): _____ p.u.

Short-Circuit Equivalent Pos. Seq. Reactance (XL1): _____ p.u.

Short-Circuit Equivalent Zero. Seq. Resistance (R2) cycles: _____ p.u. Short-

Circuit Equivalent Neg. Seq. Reactance (XL2), valid for initial 2 to 6 cycles:

_____ p.u.

Special notes regarding short-circuit modeling assumptions:

Generating Facility Characteristic Data (for rotating machines)

RPM Frequency: _____

(*) Neutral Grounding Resistor (if applicable): _____

Synchronous Generators:Direct Axis Synchronous Reactance, X_d : _____ P.U.Direct Axis Transient Reactance, X_d' : _____ P.U.Direct Axis Subtransient Reactance, X_d'' : _____ P.U.Negative Sequence Reactance, X_2 : _____ P.U.Zero Sequence Reactance, X_0 : _____ P.U.

KVA Base: _____

Field Volts: _____

Field Amperes: _____

Induction Generators:

Motoring Power (kW): _____
 I_2^2t or K (Heating Time Constant): _____
 Rotor Resistance, R_r : _____
 Stator Resistance, R_s : _____
 Stator Reactance, X_s : _____
 Rotor Reactance, X_r : _____
 Magnetizing Reactance, X_m : _____
 Short Circuit Reactance, X_d : _____
 Exciting Current: _____
 Temperature Rise: _____
 Frame Size: _____
 Design Letter: _____
 Reactive Power Required In Vars (No Load): _____
 Reactive Power Required In Vars (Full Load): _____
 Total Rotating Inertia, H: _____ Per Unit on kVA Base

Note: Please contact the Utility prior to submitting the Interconnection Request to determine if the specified information above is required.

Interconnection Facilities Information

Will more than one transformer be used between the generator and the point of common coupling?

Yes X No (If yes, copy this section and provide the information for each transformer used. This information must match the single-line drawing and transformer specification sheets.)

Will the transformer be provided by the Interconnection Customer? Yes ☐ No ☒

Transformer Data (if applicable, for Interconnection Customer-owned transformer): Two identical transformers will be installed. Same info for both.

Is the transformer: Single phase _____ Three phase X Size: 2500 kVA

Transformer Impedance: 5.75 % on 2500 kVA Base

If Three Phase:

Transformer Primary Winding	12470	Volts,
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☐ Delta ☒ WYE, grounded neutral ☐ WYE, ungrounded neutral

Primary Wiring Connection

☐ 3-wire ☒ **X 4-wire, grounded neutral**

Transformer Secondary Winding 480 Volts,

☐ Delta ☐ WYE, grounded neutral ☒ **X WYE, ungrounded neutral**

Secondary Wiring Connection

☒ **X 3-wire** ☐ 4-wire, grounded neutral

Transformer Tertiary Winding	N/A	Volts,
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☐ Delta ☐ WYE, grounded neutral ☐ WYE, ungrounded neutral

Transformer Fuse Data (if applicable, for Interconnection Customer-owned fuse):

(Attach copy of fuse manufacturer's Minimum Melt and Total Clearing Time-Current Curves)

Manufacturer: TBD Type: Size: Speed:

Interconnecting Circuit Breaker (if applicable):

Manufacturer: _____ Type: _____

Load Rating (Amps): Interrupting Rating (Amps): Trip Speed (Cycles):

Interconnection Protective Relays (if applicable):**If Microprocessor-Controlled:**

List of Functions and Adjustable Setpoints for the protective equipment or software:

	Setpoint Function	Minimum	Maximum
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____

If Discrete Components:

(Enclose Copy of any Proposed Time-Overcurrent Coordination Curves)

Manufacturer Setting	Type:	Style/Catalog No.	Proposed
_____	_____	_____	

_____	_____	_____	

_____	_____	_____	

_____	_____	_____	

Current Transformer Data (if applicable):

(Enclose Copy of Manufacturer's Excitation and Ratio Correction Curves)

Manufacturer: _____

Type: _____ Accuracy Class: _____ Proposed Ratio
Connection: _____

Manufacturer: _____

Type: _____ Accuracy Class: _____ Proposed Ratio
 Connection: _____

Potential Transformer Data (if applicable):

Manufacturer: _____

Type: _____ Accuracy Class: _____ Proposed Ratio
 Connection: _____

Manufacturer: _____

Type: _____ Accuracy Class: _____ Proposed Ratio
 Connection: _____

General Information

1. One-line diagram

Enclose site electrical one-line diagram showing the configuration of all Generating Facility equipment, current and potential circuits, and protection and control schemes.

The one-line diagram should include the project owner's name, project name, project address, model numbers and nameplate sizes of equipment, including number and nameplate electrical size information for solar panels, inverters, wind turbines, disconnect switches, latitude and longitude of the project location, and tilt angle and orientation of the photovoltaic array for solar projects.

The diagram should also depict the metering arrangement required whether installed on the customer side of an existing meter ("net metering/billing") or directly connected to the grid through a new or separate delivery point requiring a separate meter.

List of adjustable set points for the protective equipment or software should be included on the electrical one-line drawing.

This one-line diagram must be signed and stamped by a licensed Professional Engineer if the Generating Facility is larger than 50 kW.

Is One-Line Diagram Enclosed? Yes **X** No _____

2. Site Plan

Enclose copy of any site documentation that indicates the precise physical location of the proposed Generating Facility (e.g., Latitude and Longitude Coordinates and USGS topographic map, or other diagram or documentation) and the proposed Point of Interconnection.

Proposed location of protective interface equipment on property (include address if different from the Interconnection Customer's address) _____

Is Site Plan Enclosed? Yes **X** No _____

Is Site Control Verification Form Enclosed? Yes **X** No _____

3. Equipment Specifications

Include equipment specification information (product literature) for the solar panels and inverter(s) that provides technical information and certification information for the equipment to be installed with the application.

Are Equipment Specifications Enclosed? Yes X No

4. Protection and Control Schemes

- ☐ Enclose copy of any site documentation that describes and details the operation of the protection and control schemes.
- ☐ Is Available Documentation Enclosed? Yes ___ No X
- ☐ Enclose copies of schematic drawings for all protection and control circuits, relay current circuits, relay potential circuits, and alarm/monitoring circuits (if applicable).
- ☐ Are Schematic Drawings Enclosed? Yes ___ No X

Applicant Signature

I hereby certify that, to the best of my knowledge, all the information provided in this Interconnection Request Application Form is true and correct.

For Interconnection Customer:

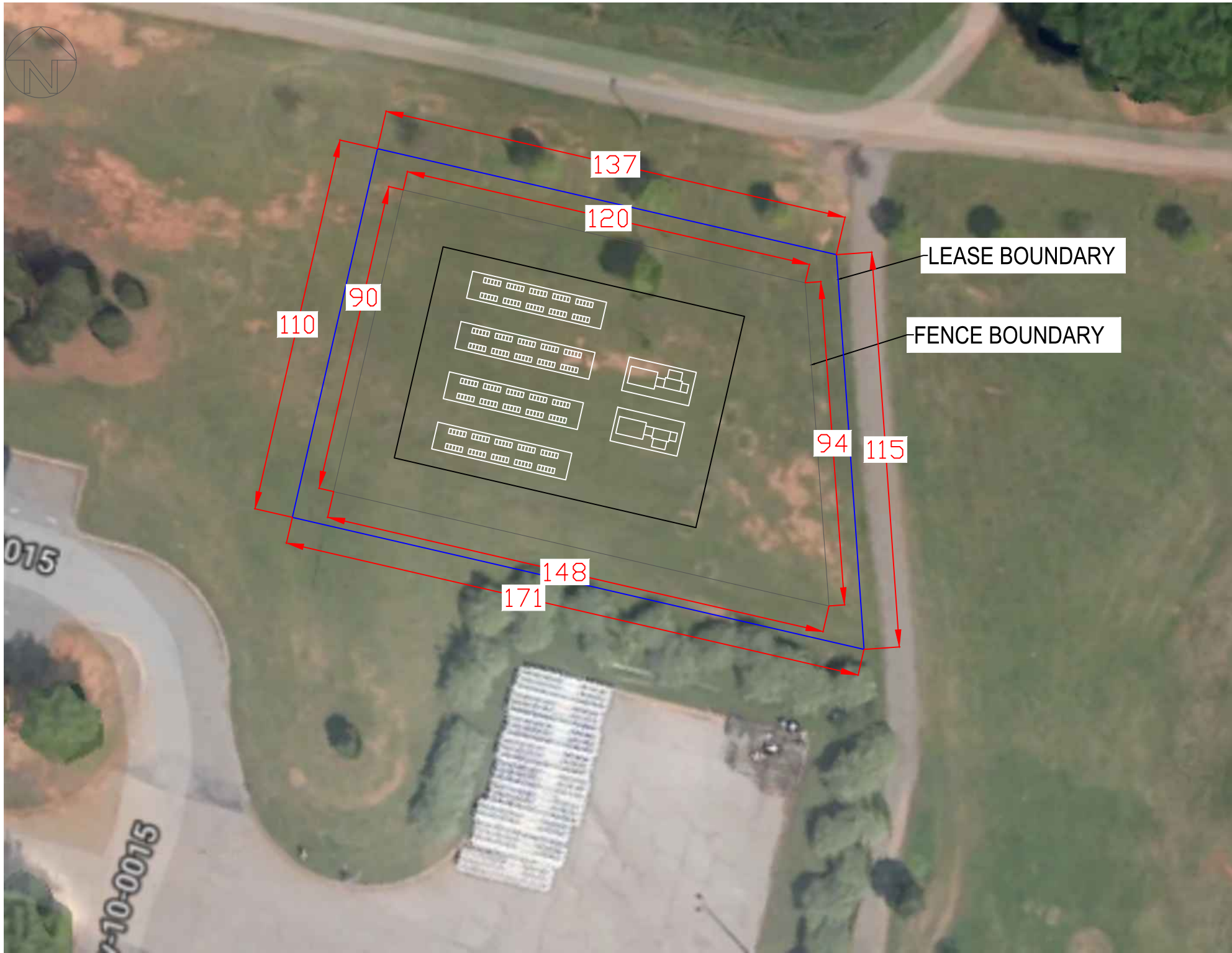
Signature

(Authorized Agent of the Legal Entity)

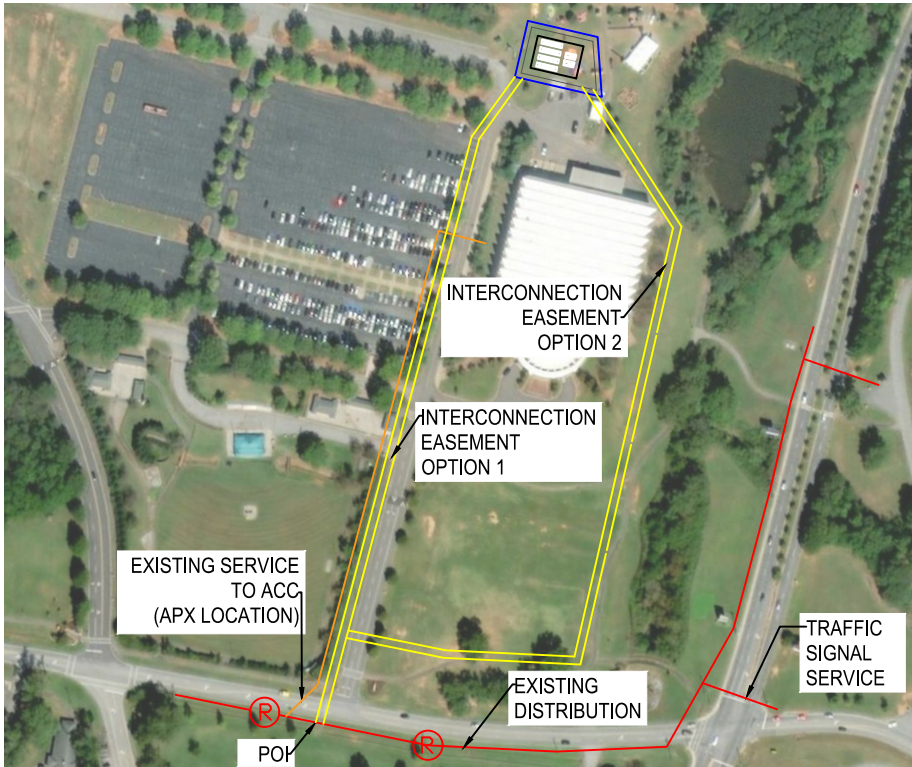
Date: 11/14/2018

Print Name


Zachary Kuznar



NOTES:
• ALL LOCATIONS ARE APPROXIMATE



PLANT INFORMATION	
APPROXIMATE ADDRESS	3027 MARTIN LUTHER KING JR BLVD ANDERSON SC 29625
SITE COORDINATES (LAT, LONG)	34.538749, -82.679978
INTERCONNECTION CAPACITY	5,000 KW AC
INVERTER	SMA 2500-EV-US
INVERTER CAPACITY	2500 KVA
INVERTER COUNT	2
AC CAPACITY	5,000 KVA
ENERGY CAPACITY	5,000 KWH

REV	DATE	JOB NO.	PROJECT TYPE	DES	DFTR	CHKD	ENGR	APPD	DESCRIPTION	 DUKE ENERGY®	SCALE:	NTS	DES:	TITLE				
2	11/13/18		BESS				SFB		UPDATE EQUIPMENT AND LAYOUT		DWG TYPE:	PLAN	DFTR:	CONCEPTUAL SITE PLAN				
1	09/04/18		BESS				SFB		UPDATE BESS CAPACITY AND LAYOUT		JOB NO:		CHKD:	FOR ANDERSON COUNTY CIVIC CENTER BESS				
0	06/25/18		BESS				SFB		FOR PRELIMINARY REVIEW		DATE:	06/25/18	ENGR:	SFB	DWG SIZE	DRAWING NO.	SHEET NO.	REVISION
											FILENAME:	SITEPLAN_ACC.DWG		APPD:		ANSI B	11"x17"	